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Somatic comorbidity and other factors related to suicide attempt among Polish methadone maintenance patients

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Abstract

Objectives—Fatal and non-fatal suicide attempts are far more common in opioid dependent individuals than in the general population. More research is needed to understand the specific risk factors for suicidal behaviors in this patient population, particularly outside of the U.S. and Western Europe. This study investigated the correlates of suicide attempts among Polish patients in methadone maintenance treatment and interpreted results in the context of findings from other countries.

Methods—The study was based on a sample of 240 individuals recruited from a methadone maintenance clinic in Poland. Participants were interviewed using standardized measures.

Results—Consistent with studies in other countries, sexual abuse, depression, alcohol dependence and impulsivity were associated with suicide attempt. Additionally, those patients with somatic comorbidity had an increase in odds (OR=2.6) of suicide attempt.

Conclusion—The results of our study suggest a potential benefit to treatment approaches that address somatic concerns of methadone maintenance patients. More research is needed to identify, assess and understand possible cultural and regional differences between opioid dependent populations to better tailor prevention strategies.

Keywords

suicide attempt; opioid dependence; childhood sexual abuse; somatic comorbidity

Introduction

The suicide rate among individuals with opiate use disorders is 14 times greater than in general population (Harris and Barraclough, 1997). Additionally, the prevalence of

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attempted suicide is much higher in this group than in general population, with a lifetime prevalence of 17-40%, compared to 3-5% in the general population (Borges et al., 2000, Darke and Ross, 2001, Pirkis et al., 2002), and 12-month prevalence of 8-10 %, compared to 0.4-2.2% (Vingoe et al., 1999, Darke and Ross, 2001, Pirkis et al., 2002). The prevalence of potential predictors of suicide (e.g., coexisting psychopathology, social and family dysfunction, sexual and physical abuse, etc.) among opiate users far exceeds that observed in non-drug users (Darke et al., 2012). The same factors may influence vulnerability to suicide behavior as well as to drug dependence, and the overall risk for suicide may be increased by impaired decision-making associated by the ongoing substance use (Maloney et al., 2007).

Among patients receiving treatment for opiate dependence, it is important to identify which patients might be at particularly elevated risk for suicidal behaviors. Because those individuals who have attempted suicide in the past are at much greater risk for suicide than individuals who have not attempted suicide (Beghi et al., 2013), examining factors associated with suicide attempt can inform understanding of future risk for suicide. Thus, the identification of factors associated with past suicide attempts could help guide targeted intervention efforts for high-risk patient subgroups.

Previous research on the specific risk factors for suicide attempts in opiate dependent patients has been carried out in western, high income countries, such as Norway (Rossow & Lauritzen, 2001), France (Trémeau et al., 2008), Australia (Darke et al., 2012, Darke and Torok, 2013), the United States (Roy, 2010), Canada (Cedar Project, 2009), and Taiwan (Wang et al., 2012). To the best of our knowledge, there have been no studies of correlates of suicide attempts among persons with heroin addiction in Eastern European countries or former USSR republics. Regional and cultural differences in factors associated with suicide risk remain unclear. Suicide rates, as well as drug and alcohol consumption levels, differ across countries, and are relatively high overall in Eastern Europe and former USSR republics (WHO, 2014a). Social and economic transition over the last two decades in these countries may have influenced suicide rates as well as psychoactive substance consumption (Schneider et al., 2009). It is important to analyze risk factors for suicide attempt in different populations of substance dependent individuals in order to develop hypotheses as to how medical, social and economic factors may influence suicide behaviors.

Previous research on general population samples reported a significant association between medical conditions and suicidality (Druss et al., 2000, Qin et al., 2013). However, to the best of our knowledge, very little attention has been paid to somatic comorbidity as a potential risk factor for suicide attempt in opioid dependent individuals. The present study reports on data collected from a sample of opioid dependent individuals receiving methadone maintenance treatment (MMT) in Warsaw, Poland. Our objectives were:

1. to estimate the lifetime prevalence of suicide attempts in patients of a MMT clinic in Poland.
2. to describe the prevalence of specific clinical (including somatic comorbidity) and socio-demographic (including economic) characteristics of patients of a Polish MMT clinic with and without lifetime suicide attempt.

3. to assess the association of key clinical and socio-demographic characteristics with lifetime suicide attempt, after adjustment for other characteristics in a regression model.

Additionally, we aimed to interpret the findings in the context of similar studies from other countries in order to identify potentially common and unique correlates of suicide attempts in opioid dependent patients across settings.

Materials and Methods

The study was based on a sample of 240 opioid dependent individuals recruited in a MMT Clinic in Warsaw, Poland. To be eligible, patients had to be between the ages of 18 and 55 and had to meet International Classification of Diseases 10-th Edition (ICD-10) (WHO, 2013) criteria for opioid dependence. The exclusion criteria were severe cognitive impairment (assessed during psychiatric examination at the entrance to MMT, and confirmed with Wechsler Adult Intelligence Scale (Wechsler, 2008)) precluding ability to provide informed consent, and intoxication at the time of recruitment. Participation was voluntary. Participants were not compensated for their participation, consistent with institutional research policies. The patient's informed consent to participate was obtained in writing, a copy given to the participant, and another copy filed in a confidential research file. Participants were informed that any information collected in the study would be kept strictly confidential. The detailed protocol for this study was approved by the Ethical Committee at the Medical University of Warsaw.

Patients at the MMT clinic were asked if they were interested in participating in the study by research staff, regardless of how long they had been engaged in MMT treatment. Research staff assessed for eligibility and performed informed consent procedures. All interviews were conducted by trained interviewers independent of information obtained for clinical purposes.

Lifetime suicide attempts were measured with Suicidality Module of the Mini International Neuropsychiatric Interview (M.I.N.I.), a structured diagnostic interview for DSM-IV (Sheehan et al., 1998). To assess the severity of suicidal intention associated with the most severe suicide attempt, the Beck Suicide Intent Scale (BSI) (Beck, 1974) was administered. Additionally, to identify the severity of suicidal ideation at the time of the interview, Beck Scale for Suicide Ideation (BSS) (Beck et al., 1979) was used.

All participants were asked to complete a questionnaire that included questions concerning demographics, economic status, as well as previously described risk factors for suicide attempt. The questionnaire included five items about the family history by asking: "Has anybody of your family been alcohol dependent? ...drug dependent? ...committed suicide? Has anybody of your family needed psychiatric treatment?" The following scales were specifically used to assess characteristics that have been previously found to be associated with suicidality:

- 1) severity of alcohol and drug dependence: Severity of Dependence Scale (SDS) (Gossop et al., 1995), The Michigan Alcohol Screening Test (MAST) (Selzer, 1971),

- 3) sleep difficulties: Sleep Problems Questionnaire (SPQ-7) (Douglass, 1994),
- 4) impulsivity: Barratt Impulsiveness Scale (BIS) (Patton et al., 1995),
- 5) depressive symptoms: Patient Health Questionnaire (PHQ-9) (Wittkamp et al., 2007),
- 6) quality of life: The Medical Outcomes Study Social Support Survey (MOSSSS) (Sherbourne and Stewart, 1991).

In addition to known factors related to suicide, we added several characteristics that have been less well-studied in the literature. This included somatic comorbidity, which was assessed with the Health Survey (SF-36) (Ware et al., 1993). Special attention was paid to coexisting pain using the Brief Pain Inventory (BPI) (Cleeland, 1994). Questions concerning somatic comorbidity included: “Have you ever been hospitalized due to somatic disorders? Have you been diagnosed with any of somatic disorders? What kind of disorders? Have you ever received Disability Living Allowance?” Those who have ever been hospitalized due to somatic disorders and received Disability Living Allowance were qualified as having severe somatic disorder (current or past).

Categorical variables were summarized with frequencies and percentages of the total sample. All continuous variables appeared to be non-parametric after checking for normal distribution by the Kolmogorov-Smirnov test and are presented with their median and quartiles (25th and 75th percentiles). Differences between opioid dependent individuals with and without lifetime suicide attempt were examined using chi-square tests for categorical variables and the Mann-Whitney U tests for all continuous variables to account for the lack of normality. Finally, a multivariable logistic regression tested the adjusted associations between patient factors and suicide attempts. This model included only those demographical and clinical variables that were of primary interest and were found to be significantly associated with suicide attempt in the unadjusted analyses.

To examine potential regional differences, we compared our findings to prior cross sectional studies from other countries. Because of the limited number of studies, we included not only studies on opioid dependent patients but also studies where the majority of participants were opioid dependent. Due to differences between studies in the clinical and sociodemographic characteristics assessed and/or included in analysis, meta-analysis and direct quantitative comparison of effect sizes was not possible. However, to present the comparison in more systematic way, a method described by Beghi et. al (2013) was applied. Factors analyzed in the included studies were counted and presented in the table as a number of studies with significant results as a ratio of the number of studies in which this specific risk factor was analyzed.

Results

The sample consisted of 240 participants, 169 (70.4%) of who were male and with a median age of 34 (interquartile range: 31-36). All participants were Caucasian. The median duration of MMT was 34 months (interquartile range: 23-55). The median number of prior admissions to detoxification units was 7 (interquartile range: 4-12), and the median number

of admissions to rehabilitation units was 2 (interquartile range: 1-4). All of the participants were being treated with oral methadone daily. The median daily dose at entrance to MMT was 80 mg (interquartile range: 60, 90). At the time of collecting data, median methadone dosage had not changed.

Almost forty percent of the sample (n=94, 39%) reported lifetime suicide attempt. Half of those individuals who made an attempt had only made one prior suicide attempt (n=45, 48%), 27 % (n=25) reported two, and 25% (n=24) reported three or more suicide attempts. The most common suicide method was drug intoxication/overdose (56%). Violent suicide methods, like penetrating lesions and hanging, were less frequent (23% and 21% respectively). Those who attempted suicide reported that they had an intense desire to die at the time of the attempt (BSI median score: 13, interquartile range: 8-15). The characteristics of the study sample stratified by history of suicide attempts are shown in Table 1.

When comparing socio-demographic characteristics between individuals with and without lifetime suicide attempt, we did not find any significant differences with regard to sex, education level, marital or economic status. However, those who attempted suicide were more likely to be older (U= 5406, p= 0.008) and had less social support (U=4721, p= <0.001). No significant differences in family history of alcohol dependence, drug dependence, psychiatric disorders and suicide behaviors were found.

MMT patient with and without lifetime suicide attempt differed with regard to a number of clinical characteristic. Those who made a suicide attempt were more likely to suffer from psychiatric disorders and receive psychiatric treatment ($\chi^2=8.3$, p=0.004). Individuals with a history of suicide attempt had more depressive symptoms (U=4585, p=<0.001), greater impulsivity (U=5494, p=0.011) and more sleep difficulties (U=5152, p=0.001). Their somatic condition was also worse (SF-36 Physical Component: U=4852, p<0.001). They were more likely to suffer from severe somatic disorders like hepatitis, HIV/AIDS, deep venous thrombosis and bacterial infections, including these related to injecting ($\chi^2=13.3$, p<0.001). Hepatitis C was diagnosed in 24.4 % among those with lifetime suicide attempt and HIV/AIDS in 10.6 % (13.0% and 2.7% in those without lifetime suicide attempt respectively). Lifetime suicide attempt was also associated with higher pain (BPI) scores (U=25076, p=0.001).

Interestingly, we did not find any differences by severity of drug dependence between the groups defined by suicide attempt history. However, individuals with lifetime suicide attempt were more likely to be alcohol dependent (MAST: U=5150, p=0.001). Lifetime suicide attempt was associated with sexual ($\chi^2=10.2$, p=0.001) and physical abuse ($\chi^2=3.78$, p=0.05), especially for abuse occurring during childhood or adolescence (sexual abuse victim before age 18: $\chi^2=12.3$, p<0.001; physical abuse victim before age 18: $\chi^2=10.8$, p=0.001).

A multivariable logistic regression was performed to further examine the association of specific characteristics with lifetime suicide attempt (the dependent variable) in opioid dependent individuals. Only variables that were previously found to be associated with suicide attempt in the bivariate analyses were included in this model (Table 2).

Characteristics that are part of suicidal behaviors (multiple suicide attempts, suicide intent-BSI score, suicide ideation- BSS score) were not included in the model as independent variables due to conceptual overlap with the dependent variable. The overall model was statistically significant ($\chi^2 = 57.3$, $p < 0.0001$), explained an estimated 21.4% (Cox and Snell R square) to 29% (Nagelkerke R square) of variance in suicide attempt status, and correctly classified 73.4% of cases. Suicide attempt in opioid dependent individuals was associated with sexual abuse in childhood or adolescence, with an OR =4.6 (95% CI: 1.7, 12.6, $p = 0.003$). Somatic comorbidity was associated with a more than twofold increase in odds of suicide attempt (OR=2.6, 95% CI: 1.4, 4.7, $p=0.002$). Older age, depressive symptoms and lower scores in social support scale remained statistically significant correlates of suicide attempt in the adjusted model.

We compared these results to selected studies on risk factors of suicide attempts in opioid dependent individuals in other countries (Table 3). Surprisingly, despite the fact that Poland has a higher overall suicide rate than the countries in which the studies listed in Table 3 were conducted (WHO, 2014b), the prevalence of suicide attempts among opiate dependent individuals in this study was very similar to that found for opiate dependent individuals in other locations. The most consistent correlates of suicide attempt among opioid dependent individuals in the prior studies were female gender, sexual abuse, depression, polydrug addiction, and impulsivity (Table 4). When comparing results from previous research with the present study, we did find significant associations of sexual abuse, coexisting alcohol dependence, and depression with suicide attempts, similar to several other samples. However, female gender in our Polish sample was not correlated with the suicide attempt. Of the prior studies, in only the Norwegian sample was female gender not correlated with suicide attempt; in the French study, gender differences were not statistically significant ($p=0.06$), but this may have been due to the limited sample size. In both the present and prior studies, depression was consistently a statistically significant correlate of suicide attempt in multivariable models. Somatic comorbidities have not been analyzed in prior studies.

Discussion

The present study found that close to 40% of adults in MMT reported lifetime suicide attempt. In addition, somatic comorbidity emerged as a potentially important correlate of non-fatal suicide attempt in opioid dependent patients. Severe somatic disorders, like hepatitis, HIV/AIDS, deep venous thrombosis, and bacterial infections were associated with a greater than two-fold increase in odds of suicide attempt history (OR=2.6).

To the best of our knowledge, previous research has not paid special attention to a possible correlation between somatic comorbidity and suicide attempts in opioid dependent individuals. However, the Cedar Project (Cedar Project, 2009), which examined a sample of young Aboriginal people in Canada with injection and non-injection drug use, found a correlation between attempted suicide and sexually transmitted infections ($p=0.034$). Prior research has found a positive correlation of somatic diagnosis and suicide mortality in the general population (Beghi et al., 2013). Recently other general population studies identified the diagnosis of cancer (Fang et al., 2012), chronic obstructive pulmonary disease, spine

disorders, asthma and stroke (Crump et al., 2014) as important predictors of suicide. In the present study, hepatitis was the most common somatic disorder in those with lifetime suicide attempt. Increased somatic morbidity in dependent opioid users, especially those injecting heroin, has been well documented in the literature (Popowa et al., 2007, Skeie et al., 2011). The results of our study suggest that a holistic, multifaceted treatment approach in MMT clinics, which would address not only psychiatric and social but also somatic concerns, could be potentially beneficial for prevention of suicide attempts.

The present study provides evidence that sexual abuse at the age under 18 is a particularly salient factor for risk of suicide attempt in opioid dependent individuals; those with a history of sexual abuse when less than 18 years old had more than four times the odds of having attempted suicide (OR =4.6). Prior research has identified childhood adversity as a risk factors for suicidal thoughts and behaviors in the general population (Hjelmeland, 1996, Sinclair et al., 2007, Beghi et al., 2013). Other authors have also underlined the importance of sexual abuse at the age before 18 specifically in opioid dependent individuals (Rossow and Lauritzen, 2001, Cedar Project, 2009, Roy, 2010).

A number of previous studies have reported the comorbidity of Axis I or Axis II disorders as predictors of suicide attempt among individuals with substance use disorders (Maloney et al., 2007, Roy, 2010, Wang et al., 2012). Our findings highlight the importance of mood disorders as a correlate of suicide attempt. Another well-documented correlate of suicidal behaviors is impulsivity, which is associated with suicide attempts as well as suicide mortality (Beghi et al., 2013).

To the best of our knowledge, this is the first study of suicide attempts among opioid dependent individuals in an Eastern European sample. On average, national suicide rates in eastern European countries are higher than in western European countries (WHO, 2014b). It was previously reported that changes in political regimes, especially in former communist Eastern Europe, have influenced suicide rates (Mäkinen, 2006). However, it is important to note that Eastern European countries and former USSR republics have had varying trends in suicide rates after political transition. This is consistent with the fact that suicidality is a very complex phenomena and depends on many different factors, which also can influence one another. Although the suicide rate in Poland is not higher on average than in other countries of the former Eastern Bloc, it decreased only 10.5% between 2002 and 2012, in contrast with the 30-45% decreases observed for suicide rates in most other European countries (WHO, 2014b). The present findings suggest that, in Poland, those receiving MMT are a high risk group for suicidal behavior.

This study aimed to identify correlates of suicide attempt in opioid dependent individuals in Poland. To provide context for the results, they were compared to previously published studies conducted in other countries. We found both similarities and differences between the present study and prior published reports. This included a consistent finding that depression, sexual abuse, and impulsivity are related to suicide attempts, but a failure to find a gender association, as was found in many prior studies. It is possible that this difference in finding may be due to cultural and economic differences between Western and Eastern European

counties, although it is beyond the scope of this study to make inferences as to the origin of this difference.

The present study should be interpreted with caution for several reasons. First, the study sample was relatively small. The collected data was partially based on self-report inventories and could be subject to reporting biases, particularly for sensitive topics like childhood maltreatment or ongoing substance. Data were cross-sectional in nature, and in some cases, the symptoms and characteristics reported at the time of assessment may not have been present in the period before a suicide attempt.

Despite these limitations, these findings indicate the need for further studies to explore and better understand risk for suicide in opioid dependent individuals. Treatment guidelines have been developed to improve the management of suicide risk among individuals treated for substance use disorders (SAMHSA, 2009). However, the extent to which treatment follow these guidelines is unknown and likely vary from one country to another. The present results indicate the salience of somatic and psychiatric symptoms for suicide risk in those treated in MMT programs in Poland. The remaining findings are largely consistent with studies of suicide attempts among opiate dependent individuals in non-Eastern European locations, although the gender effect found in prior studies was not replicated here. Consistent with the existing treatment guidelines, MMT providers should be aware of these risks and assess patients for suicidal thoughts and behaviors and discuss strategies for them to seek psychiatric help, if needed, during and after receipt of MMT.

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Table 1
Characteristics of Polish MMT patients, by lifetime suicide attempt

	Lifetime Suicide Attempt			
	No (n=146, 60.8%)	Yes (n=94, 39.2%)	χ^2/U	p-value
Socio-demographic				
age- years, median, IQR	33 (31-36)	35 (32-38)	5406	0.008
female- n (%)	43 (29.5)	28 (29.8)	0.003	0.956
married/common-law married- n (%)	48 (20.1)	21 (12.4)	0.06	0.806
12+ years of education- n (%)	50 (34.2)	32 (34.0)	0.4	0.545
employed- n (%)	77 (52.7)	50 (53.2)	0.001	0.989
anyincome in last month- n (%)	72 (49.3)	44 (46.8)	0.185	0.667
social support (MOSSS)- median, IQR	75 (55-85)	57 (42-77)	4721	<0.001
family background				
alcohol dependence- n (%)	83 (56.8)	68 (72.3)	5.8	0.056
drug dependence- n (%)	32 (21.9)	24 (25.5)	1.6	0.662
suicide- n (%)	23 (15.8)	18 (19.1)	0.4	0.817
psychiatric disorders- n (%)	28 (19.2)	27 (28.7)	3.0	0.218
health				
psychiatric treatment- n (%)	12 (8.2)	20 (21.3)	8.3	0.004
severe somatic disorder- n (%)	43 (29.5)	50 (53.2)	13.3	<0.001
mental health (SF36 Mental Component)-median, IQR	47 (37-53)	39 (31-46)	5926	0.089
physical health (SF36 Physical Component)- median, IQR	48 (40.6-51.2)	40 (32.6-48.5)	4852	<0.001
depression (PHQ-9)- median, IQR	10 (6-16)	15 (10-21)	4585	<0.001
sleep disorders (SDQ-7)- median, IQR	8 (4-14)	11 (8-17)	5152	0.001
impulsiveness (BIS)- median, IQR	65 (61-69)	67 (63-72)	5494	0.011
suicidal intent, severity at most serious attempt (BSI)- median, IQR	0 (0-4.25)	13 (8-15)	228	<0.0001
current suicide ideation (BSS)- median, IQR	0 (0-0)	7.5 (4-15)	543	<0.0001
multiple suicide attempts (lifetime)- n (%)	0 (0)	49 (52)	95	<0.0001
pain severity score (BPI)- median, IQR	1.38 (0-3.5)	2.75 (0.9-4.4)	5076	0.001
alcohol and substance use				
severity of drug dependence (SDS)- median, IQR	11 (9-13)	11 (9-13)	6369	0.389
alcohol dependence (MAST)- median, IQR	12 (9-19)	17 (11-25)	5150	0.001
number of detoxifications- median, IQR	7 (4-11)	7 (5-12)	6485	0.526
MMT in months- median, IQR	28 (22-50)	38 (22-90)	2099	0.124
Abuse history				
sexual abuse victim before age 18- n (%)	8 (5.5)	19 (20.2)	12.3	<0.001
sexual abuse victim after age 18- n (%)	5(3.4)	14 (14.9)	10.2	0.001
physical abuse victim before age 18- n (%)	24 (16.4)	33 (35.1)	10.8	0.001
physical abuse victim after age 18- n (%)	21 (14.4)	23 (24.5)	3.78	0.05
number of other traumatic events- median, IQR	2 (1-4)	3 (2-5)	4915	0.001

IQR: Interquartilerange

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Table 2
Logistic regression model of Polish MMT patient characteristics associated with lifetime suicide attempt

Variable	Odds Ratio (95% CI)	<i>p</i>
severe somatic disorder	2.6 (1.4, 4.7)	0.002
impulsiveness (BIS)	1.03 (0.99, 1.06)	0.161
social support (MOSSSS)	0.98 (0.97, 0.99)	0.007
depressive symptoms (PHQ-9)	1.07 (1.02, 1.1)	0.006
sexual abuse victim before age 18	4.6 (1.7, 12.6)	0.003
age	1.06 (1.01, 1.1)	0.03

Table 3
Summary of previous studies of suicide among opiate dependent individuals

STUDY	YEAR	LOCATION	N	SAMPLE TYPE	SUICIDE ATTEMPT HISTORY (%)	CORRELATES WITH SUICIDE ATTEMPT IN MULTIVARIABLE ANALYSIS	CORRELATES WITH SUICIDE ATTEMPT IN BIVARIATE ANALYSIS
Rossow, I. &Lauritzen, G	2001	Norway; substance abuse treatment centers	800	any illicit drug use	38	(not reported)	sexual abuse, bullying victimization, father's alcohol abuse, mother's psychiatric problems, school problems, psychiatric problems during childhood and early adolescence
Tréneau, F. et al.	2008	France; MMT clinic	160	opiate dependence	48	Family history of suicide	family history of suicide, early onset of heroin use, higher impulsivity
Cedar Project	2009	Canada; Aboriginal people recruited by health care providers	605	Any illicit drug use	37	sexual abuse, overdose	female gender, having been taken from biological parents, sexual abuse, ever having been on the streets for more than three nights, younger age of first consensual sexual experience, sexually transmitted infection, injection drug use, overdose
Roy, A.	2010	US; substance abuse treatment program & community mental health center	527	Opiate dependence	39	family history of suicidal behavior, alcohol dependence, cocaine dependence, and treatment with antidepressant medication	younger, female gender, childhood trauma (sexual, physical and emotional abuse), a family history of suicidal behavior, a history of aggression, treatment with antidepressant medication, and alcohol and cocaine dependence
Wang, L.-J. et al.	2012	Taiwan; detention center & psychiatric hospitals	197	mainly opioid or methamphetamine dependence	14	female gender, primary mood disorders, drug-induced mood disorder	(not reported)
Darke, S. &Torok, M.	2013	Australia; needle exchange programs	300	any illicit drug use (opiate 86.3%)	26	severe or frequent childhood physical abuse, home avoidance due to conflict, female gender, conduct disorder, extensive polydrug use	severe or frequent childhood physical abuse, home avoidance due to conflict, female gender, conduct disorder, extensive polydrug use, higher impulsivity, early onset of heroin use, borderline personality disorder

Table 4
Summary of correlates of suicide attempt history among opiate dependent individuals
across 6 studies (see Table 3 for list of studies included)

Variable	Number of times found to be a correlate in bivariate analysis (Total times tested)	Number of times found to be a correlate in multivariable analysis (Total times tested)
female gender	4 (6)	2 (4)
sexual abuse	3 (3)	1 (2)
depression	1 (1)	2 (2)
poly drug addiction	2 (2)	2 (3)
impulsivity	2 (2)	0 (2)